TVA Reservoir System

The purpose of the study is to determine if changes in TVA's reservoir system operating policies would produce greater overall public value.

Description

- The Tennessee River system, the nation's fifth-largest, includes 650 miles of commercial waterway from Knoxville, Tennessee, to Paducah, Kentucky.
- TVA's system of 49 dams and 13 locks works as an integrated system that allows TVA to regularly adjust the river's water level.
- The system is operated to provide a variety of benefits, including flood control, navigation, power production, water quality and water supply, land use, and recreation.
- Reservoir system operating policies affect how much reservoir levels rise and fall, when changes in reservoir levels occur, and the amount of water flowing through the reservoir system at different times of the year, depending on rainfall.

Definitions

- Tributary dams—those built on the rivers that flow into the main Tennessee River—serve to store water for flood control. This stored water is released downstream to maintain the water levels needed for navigation, recreation, power production, water supply, and water quality in the main channel.
- Main-river dams are built on the Tennessee River's main channel and form reservoirs that extend the navigation channel from one dam to the next. Locks at these dams raise and lower boats and barges from one reservoir to another.
- Lakes are large inland bodies of fresh or salt water. Reservoirs are bodies of water retained by a dam. Water is collected and kept in quantity for a variety of uses, including flood control, water supply, recreation, and hydroelectric power. At maximum fill, reservoirs in the TVA system can look like natural lakes, but unlike lakes, their water levels change by design, not chance.
- Watersheds are drainage areas or basins in which all land and water areas drain or flow toward a central collector such as a stream, river, or reservoir at a lower elevation.

The Annual Cycle

- Water in the Tennessee River system rises and falls in an annual cycle. For the reservoirs on the main Tennessee River, this change can be relatively minor. Because these reservoirs are designed for navigation, they must be deep enough to allow for safe barge travel.
- Reservoirs on the tributary rivers serve a different purpose. They store the precipitation that falls in higher elevations to prevent flooding downstream.
- To make room for this water, the reservoirs are lowered considerably by January 1 each year. Tributary reservoirs may rise and fall from 35 to 90 feet over the course of a year.

- During the summer months, a process called thermal stratification occurs in many tributary reservoirs. The water stratifies, or separates, into two layers: a warm surface layer that's relatively rich in dissolved oxygen and a colder bottom layer. The two layers don't mix because of the temperature difference, so the oxygen in the bottom layer isn't replaced.
- Hydroturbine intakes typically draw water from these deeper levels, creating low-oxygen conditions downstream of a dam. This can cause problems for fish and other types of aquatic life, which depend on oxygen as much as creatures living on land do.
- Because conditions are different at each dam, TVA uses a wide range of methods to improve dissolved oxygen levels.

For More Information

To submit comments or get additional information, members of the public are invited to visit TVA's Web site at www.tva.com, to call toll-free 888-882-7675, to fax TVA at 865-632-3146, or to write to ROS Project Manager David Nye, Tennessee Valley Authority, c/o WT 11A, 400 West Summit Hill Dr., Knoxville, TN 37902.